



# Who emerges as a leader? Meta-analyses of individual differences as predictors of leadership emergence

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## ABSTRACT

For more than sixty years, the leaderless group discussion (LGD) has been commonly used to assess leadership emergence and potential. This research focuses on individual differences as predictors of leader emergence in LGDs. Meta-analytic methods allowed us to combine and compare results from 45 studies, producing 196 effect sizes, and make statistically guided decisions about the strength of relationships between individual difference and personality variables and leadership emergence in LGDs. Consistent with more general research on leader emergence and effectiveness, we found a number of individual differences predictive of leader emergence in LGDs, most notably extraversion and authoritarian personality. This research augments previous meta-analytic research on personality and leadership with a focus specifically on the leaderless group discussion.

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## 1. Introduction

Although early research suggested that personality was a poor predictor of leadership emergence and effectiveness (e.g., Stogdill, 1948), more recent evidence suggests that personality traits can indeed account for some of the variance in leadership (e.g., Bass, 1990; House & Aditya, 1997; Kenny & Zaccaro, 1983; Lord, de Vader, & Alliger, 1986; Zaccaro, Foti, & Kenny, 1991). A qualitative and quantitative review indicated that 4 of the Big Five personality traits (i.e., neuroticism, extraversion, openness to experience, and conscientiousness) predicted leadership emergence, with a combined multiple correlation of 0.48 (Judge, Bono, Ilies, & Gerhardt, 2002). Thus, it appears that traditional personality traits can predict leader emergence.

Yet, our interest was more specific. Building on past research, we sought to examine the role that personality traits and other individual differences (e.g., intelligence, social skills, self-efficacy) play in predicting leader emergence in largely unacquainted groups of individuals. This is important, because not all groups are homogenous – and there may be unique effects that affect such leaderless group discussions (LGDs). Also, while others have applied the Big Five factors with some efficacy, we argue against using an a priori framework for organizing personality variables, believing it would be more robust if we examined all of the individual difference predictors and created meaningful clusters of

related constructs. If a set of variables consistent with the Big Five emerges, then the pattern is certainly more meaningful; it further helps validate findings of both the existing literature and recent trends of published meta-analyses.

### 1.1. Variables identified for inclusion

An important advancement in the study of leadership has been observations that individuals emerge as group leaders by fitting the shared conceptions of followers, arguing the importance of followers in the leadership process (e.g., Brown & Lord, 2001; Hogg, 2001). The shared conceptions exist as a collection of traits that comprise a leader prototype, and allow followers to predict and understand leader behavior. Furthermore, the followers' perspective is a useful vehicle for understanding leadership (Hollander, 1992).

Previous studies show that people share a set of general beliefs about the attributes that are related to leadership in diverse situations (Foti, Fraser, & Lord, 1982). If a target individual is perceived by the follower as a manifestation of these prototypical leader qualities, the target individual is likely to be identified and rated as a leader (Foti et al., 1982). Leaders, thus, exemplify these traits, yet perceivers become an integral component in this leadership process, as these followers must observe and identify these traits. Under emergent leadership theory, task leaders are believed to emerge from a group of individuals through processes of competition and elimination (Johnson & Bechler, 1998). Members who are perceived as inflexible and uninformed are typically eliminated

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from leader selection by the group. The remaining individuals are assessed by group members in an environment of “competition,” and contenders continue to be eliminated until a leader finally emerges who meets the group’s task and social needs. Emergence theory asserts that certain behaviors/attributes typically lead to elimination from leadership contention, while a distinct pattern of behavior and skills consistently lead to leadership selection (Foti et al., 1982). Bormann’s (1990) Minnesota Studies present evidence indicating certain attributes increase or decrease the likelihood of an individual emerging as the leader of a given group. While these qualities do not necessarily translate to leadership effectiveness, they do relate directly to leader emergence.

### 1.2. The leaderless group discussion

Historically, the leaderless group discussion (LGD) has been widely used as a technique to study leader emergence and leadership potential. Typically, LGDs involve a group of individuals (e.g., job candidates, team members) brought together in a general problem-solving session or an informal discussion. Importantly, there is generally no appointed leader. This style of discussion naturally results in facilitated exchange of ideas, group interaction, and opportunities for members to take on leadership roles. Trained observers are often used to rate the individual group members on their leadership potential or to identify the individual(s) who emerged as the group’s informal “leader.” Alternatively, rather than employing observers, leadership can be measured by having the group members evaluate which of their peers emerged as the leader, or exhibited more effective leadership. These leadership measures were used as the key dependent variables in the present meta-analyses.

Leaderless group discussions have been used as part of assessment centers for leader selection for well over 60 years. Although there is evidence for the predictive validity of leadership ratings in the assessment centers, these ratings are typically aggregated across the various exercises, with these summative evaluations being correlated with criterion variables such as leadership potential and career progress (Howard, 1997). In our review of the literature, we encountered only one study that examined the correlation between LGD ratings of leadership potential from an undergraduate assessment center and supervisor ratings of leadership potential assessed two-years after graduation, and found an impressive  $r = .41$ , suggesting that LGDs do indeed predict future leadership potential (Riggio, Mayes, & Schleicher, 2003).

### 1.3. Personality Variables and Leadership Emergence

The personality profiles of emergent leaders in leaderless context have also been explored. Emergent leadership is correlated with dominance, empathy, independence (Gough, 1990), intelligence (Bass, 1954), self-efficacy (Singer, 1991), and self-monitoring (Foti & Hauenstein, 2007). Verbal expressiveness is also important in leadership emergence and effectiveness (Pondy, 1978; Reynolds, 1984). Moreover, individual prominence (e.g., striving for recognition), group goal facilitation, group sociability, physical energy (initiative), intelligence, and emotional stability are all related to leader emergence (Couch & Carter, 1952; Sakoda, 1952). In a meta-analysis, Lord et al. (1986) found that intelligence, masculinity–femininity, and dominance were related to leadership perceptions. Finally, a recent study found that extraversion and emotional stability predict emerging transformational leadership in face-to-face as opposed to virtual context (Balthazard, Waldman, & Warren, 2009).

Clearly, there is a large literature focused on personality and leadership emergence, with many overlapping themes. Yet, little effort has been made to determine which individual traits, beyond the established personality factors, influence leadership emergence

in LGD. Thus, the present study expands on previous research by examining individual traits beyond the five-factor model, and by focusing specifically on LGD. We first reviewed the relevant literature and identified the studies that examined the relationship between personality, individual traits and leadership emergence within LGD. We then utilized a meta-analytical technique to explore the traits that strongly predicted leadership emergence in LGD, and to examine the role of different moderators.

## 2. Method

### 2.1. Sample of Studies

Four different techniques were used to find relevant studies (Rosenthal, 1984). First, a computer search examining the 1966–2009 databases using key words “leaderless group”, “leadership emergence”, and “personality and leadership” was conducted. Second, the reference lists of previous studies in the available literature were examined using the ancestry approach from most recent to the oldest (Rosenthal, 1984). Third, articles that have cited other critical articles, and authors who have published critical articles were searched using the descendancy approach (Rosenthal, 1984). Finally, recent issues of the related journals were searched manually. Additional sources of studies included meta-analytical reviews that have been published in the area of leadership emergence.

### 2.2. Inclusion criteria

In all, 45 separate publications formed the basis of the present sample. When a given study contained more than one experiment or more than one group within a single experiment, the treatments contained in separate experiments within a study, and imposed on different groups within an experiment were treated as distinct observations in the analysis. If there were additional independent variables in the experiment that might interact with groups, outcomes or any of the moderator variables, separate effect sizes were calculated within each condition of these independent variables.

To be included in this meta-analysis, a study had to meet each of the following general criteria: (a) The dependent measure had to involve a leadership rating, (b) a personality characteristic had to be included as an independent variable, (c) a study had to examine leadership emergence in an initially leaderless group, and (d) necessary inferential statistics had to be reported in the article, or provided directly by the author. Evaluation of these factors was made by the author before any effect size calculations were undertaken, and without reference to the results of the particular studies. Although there are more recent studies that examined leadership emergence and its relationship to personality, only those included in the present meta-analysis met these criteria.

### 2.3. Variables coded from each study

The authors independently categorized the wide range of individual traits included in the 45 studies into general categories and then met to compare and to settle any discrepancies. As previously noted this classification was done without using any a priori classification of personality dimensions, such as the Big Five model. The resulting categories traits were: Extraversion, emotional stability, agreeableness, antagonism, neuroticism, openness to experience, masculinity, femininity, conscientiousness, authoritarianism, leadership experience/potential, self-esteem/efficacy, social skills, creativity/intelligence (see Table 1). Rather than trying to “force” a limit to the number of trait categories, the authors retained categories that they felt were conceptually distinct. For example,

**Table 1**  
The Descriptions of the Individual Difference Variables used in the Meta-Analyses.

Extraversion	Sociable, outgoing, talkative (verbal participation and verbal aptitude), makes jokes, active, energetic, overt social adjustment, extravert, optimistic, friendliness, person who asks questions, gives opinion, gives information, asks for suggestions, asks for opinion, initiate interaction, social communication, interaction oriented
Emotional stability	Emotional stability, freedom from hypersensitivity, stability, emotional maturity
Antagonism	Disagrees, seems unfriendly, aggressive
Agreeableness	Cooperative, agreeable, thoughtful, considerate
Intelligence	Intelligence, numerical aptitude, average grade in college, scholastic achievement, apprehensive, analytical thinking, cognitive complexity
Openness to experience	Imaginative, innovative, experimenting, open to experience, creative
Leadership experience/potential	Supervisory aptitude, motivation to lead, past leadership performance, visibility among associates, future success as a leader, leadership experience, initiative, decision making qualities, group goal commitment, individual goal for the group, supervisory knowledge
Self-esteem/efficacy	Self-esteem, self-efficacy
Neuroticism	Neuroticism, shows tension, sensitive, tense
Masculinity	Masculinity, masculine role
Femininity	Femininity, feminine, feminine gender role
Conscientiousness	Conscientious
Authoritarianism	Authoritarian, dominance
Social Skills	Friendliness, Gives information, Gives opinions, Gives suggestions, Other directedness, Sensitive, Socio-relevant communication, listening (marked for possible exclusion in my notes), physical relations, nurturance, sociability, group-identification
Creativity	Imagination, Experimenting, Innovation, Innovative Ideas

although some personality theorists view masculinity-femininity as independent dimensions (e.g., Bem, 1974; Spence & Helmreich, 1978), others argued that individuals can express both masculinity and femininity (i.e., androgyny, Morawski, 1987). The studies included in this meta-analysis measured the listed variables independently, therefore in our coding we erred on the side of distinctiveness of constructs. It is important to note that leadership experience/potential was measured in a number of different ways in the studies included in this meta-analysis. Specifically, these studies looked at prior leadership experience, motivation to lead, future success as a leader, visibility among associates, initiative and decision making qualities, group goal commitment, individual goal for the group, and supervisory aptitude/knowledge.

In addition, the other variables recorded were date of publication, sample size, gender of the participants, type of participants (students or workers), number of group members in LGD, duration of task in minutes, and type of rater (independent observer, self, other group members). Two independent coders were first trained, and then asked to code each study on these variables which were explored as possible moderators of the relationships between the individual traits and leadership outcomes in the LGDs.

The dependent variable of leadership emergence varied considerably across studies. Sometimes it reflected a rating of the members' explicit leadership in the LGD, their performance as a leader, or demonstration of leader-like behavior. In other cases, it was a peer nomination or self-rating of leadership skills. Yet, all represented the "bottom line" outcome of leadership performance in the LGD.

#### 2.4. Effect size calculation

For cases in which the correlation between leadership ratings and personality variables was reported, effect sizes were calculated by transforming correlation coefficient to effect size score by using Comprehensive Meta-analysis software (Borenstein, Hedges, Higgins, Rothstein, 2005). The effect sizes were based on correlation coefficients which were transformed to z-scores as suggested by Rosenthal (1984). Each of these effect sizes was converted to Fisher's z and corrected for bias. Rosenthal (1984) addresses the issue of transforming effect sizes from *r* to Fisher's *z* by explaining that *r* is one of the salient effect size estimates in meta-analysis, but as it gets further and further away from zero the distribution of *r*'s sample becomes more skewed. To correct for this, transforming *r* to Fisher's *z* is an alternative that has more practical advantages and statistical properties (Schulze, 2004). When there were multiple groups, or experimental conditions in a study, multiple effect sizes were calculated for each group, or experimental condition separately.

### 3. Results

The number of effect sizes (*K*), mean weighted effect sizes (Fisher's *z*), standard error, and homogeneity among these effect sizes (*Q*) were presented separately for each individual difference variable using a random effect model (See Table 2). The mean Fisher's *z* ranged from  $-.08$  to  $.39$  across 56 studies that produced 221 effect sizes in total. The results showed that extraversion (Fisher's  $z = .33$ ),

**Table 2**  
The number of effect sizes (*K*), Mean Weighted Effect Sizes (Fisher's *Z*), Standard error, and Homogeneity Tests (*Q*).

Individual Characteristics	<i>n</i>	Mean Fisher's <i>Z</i>	<i>p</i> -Value for Fisher's <i>Z</i>	Standard error	<i>Q</i>	<i>p</i> -value for <i>Q</i>
Extraversion	55	.33	.00	.01	396.47	.00
Emotional Stability	6	.12	.00	.04	19.41	.00
Agreeableness	7	.001	.79	.03	15.30	.02
Neuroticism	5	-.08	.06	.04	7.86	.10
Openness to experience	4	.17	.00	.04	1.65	.65
Masculinity	5	.33	.00	.05	7.06	.13
Femininity	5	-.08	.11	.05	4.85	.30
Conscientiousness	4	.19	.00	.04	1.14	.77
Antagonism	10	.20	.00	.03	22.29	.01
Authoritarianism	11	.39	.00	.02	250.59	.00
Leadership experience/potential	22	.17	.00	.01	111.95	.00
Self-esteem/efficacy	33	.17	.00	.01	115.91	.00
Intelligence	18	.32	.00	.02	41.34	.001
Social Skills	20	.14	.00	.03	205.17	.00
Creativity	4	.36	.00	.06	57.96	.00

emotional stability (Fisher's  $z = .12$ ), openness to experience (Fisher's  $z = .17$ ), masculinity (Fisher's  $z = .33$ ), conscientiousness (Fisher's  $z = .19$ ), antagonism (Fisher's  $z = .20$ ), authoritarianism (Fisher's  $z = .39$ ), leadership experience/potential (Fisher's  $z = .17$ ), self-esteem/efficacy (Fisher's  $z = .17$ ), intelligence (Fisher's  $z = .32$ ), social skills (Fisher's  $z = .14$ ), and creativity (Fisher's  $z = .36$ ) produced significant effect sizes ( $p < .05$ ). On the other hand, agreeableness, femininity, and neuroticism failed to predict leadership evaluations in LGD ( $p > .05$ ). Thus, authoritarianism, creativity, extraversion, masculinity and intelligence were found to be the strongest predictors of leadership emergence in LGD.

The tests of homogeneity among these effect sizes ( $Q$ ) were calculated to examine the variability among the obtained effect sizes (See Table 2). The results revealed significant heterogeneity among the effect sizes of extraversion ( $Q = 396.47, p = .00$ ), emotional stability ( $Q = 19.41, p = .00$ ), antagonism ( $Q = 22.29, p = .01$ ), authoritarianism ( $Q = 250.59, p = .00$ ), leadership experience/potential ( $Q = 111.95, p = .00$ ), self-esteem/efficacy ( $Q = 115.91, p = .00$ ), intelligence ( $Q = 41.34, p = .001$ ), social skills ( $Q = 205.17, p = .00$ ), and creativity ( $Q = 57.96, p = .00$ ). Variability among effect sizes points to the likelihood that a moderator variable might account for the variability in the effect sizes (Rosenthal & DiMatteo, 2001). To examine possible moderator variables, a number of variables were coded for each study by two independent coders which were found to be highly reliable ( $r = .95$ ). Moderator analyses were conducted only for those variables with three or more effect sizes per group. We have calculated between classes heterogeneity ( $Q_b$ ) (i.e., between-class goodness-of-fit statistics). Significance of  $Q$  statistics indicates rejection of the homogeneity hypothesis. As a result, we found that gender of the participants was a moderator of the relationship between self-esteem/efficacy and leadership evaluations. This relationship was stronger for males ( $d = .22$ ) than for females ( $d = .13$ ),  $Q_b = 6.83, p < .05$ . We can conclude that self-related attributes (e.g., self-esteem, self-efficacy) predicted leadership evaluations more strongly for the males than for the females. We also found that the type of participants was a moderator of the relationship between authoritarianism and leadership evaluations. More specifically, this relationship was stronger for the students ( $d = .42$ ) than for the working participants ( $d = -.01$ ),  $Q_b = 27.11, p < .00$ . All other moderational analyses were non-significant.

#### 4. Discussion

In this meta-analytic study we explored a wide variety of personality and individual difference variables as predictors of leader emergence in LGDs. Consistent with earlier research, we found that certain traits, most notably authoritarianism, creativity, extraversion, masculinity and intelligence, predict who would emerge as a leader in a previously leaderless group. However, we went above and beyond the previous work by demonstrating that a variety of individual difference variables, such as emotional stability, self-esteem/efficacy, leadership experience/potential, and social skills are also related to leadership performance in LGDs. Some of these effects were moderated, however, by gender or the type of participants (students vs. workers).

This research complements previous meta-analyses that explored the relationship between personality and leadership (e.g., Judge, et al., 2002). Using only LGDs, we also found that certain personality traits led to favorable impressions of individuals and allowed them to be more likely to emerge in positions of leadership. Chemers (1997), in his integrative theory of leadership suggests that image management is a critical component of effective leadership, so traits such as extraversion and emotional stability may predispose persons to appear more "leader-like."

Our research, however, went beyond merely focusing on the core, Big Five personality factors, as has been done on previous research on personality and leader emergence (e.g., Judge, et al., 2002), and examined a wide range of individual difference variables, finding that some of these predicted leader emergence (e.g., authoritarianism, intelligence, and extraversion), while others did not (conscientiousness, neuroticism and femininity). All of this suggests that the type of leadership situation (in our case, leaderless group discussions) is important in determining which individual differences will predict leader emergence.

LGDs are special situations where often strangers are placed in short-term, nominal groups and a leader is allowed (or required) to emerge. Aside from juries, there are few real world instances that are similar to LGDs. Yet, the technique is still used in managerial/leadership assessment centers as a means of measuring how individuals perform in ambiguous, unstructured situations, so it is important to know more about the predictors of and process of leader emergence in LGDs. At least one study suggests, however, that there is good predictive validity for leadership evaluations made in LGDs (Riggio et al., 2003).

In sum, our results suggest, consistent with a great deal of research extending back more than 60 years, that extraverted individuals are very likely to emerge as leaders in LGDs. However, we also found evidence for the importance of intelligence and social skills in leader emergence. Moreover, examined by gender, we find that men who appear authoritarian and who are self-confident (and extraverted/socially skilled) have a distinct advantage in terms of emerging as a leader in LGDs. These issues should continue to be explored in future research.

#### 4.1. Limitations & caveats

An important limitation to this study is that significant heterogeneity among the effect sizes indicates that future studies should pay even closer attention to the role of other moderator variables such as situational factors (e.g., the type of discussion, type of evaluator, and group size) and individual differences (e.g., gender and age). Finally, multiple effect sizes from a given study might be a source of non-independence, therefore an inferential technique, Tukey's Jackknife method, which takes account of the interdependencies in a large set of findings in a meta-analysis should be applied to the data to control for this.

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*Note: Studies with an "\*" were included in this meta-analysis.*

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